

Notice of Allowability

Application No.

10/790,921

Examiner

Asok K. Sarkar

Applicant(s)

LEE ET AL.

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to response filed 8/22/2005.
2. ☒ The allowed claim(s) is/are 1-5 and 8-12.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>4/8/05</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species I claims 1 – 5 and 8 – 12 in the reply filed on August 22, 2005 is acknowledged.
2. Claims 6, 7 and 13 – 19 were withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Species II claims, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on August 22, 2005.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

In view of allowable subject matters and election with traverse by the Applicant, the nonelected claims were cancelled.

The application has been amended as follows:

Claims 6, 7 and 13 – 19 have been cancelled.

Allowable Subject Matter

4. Claims 1 – 5 and 8 – 12 are allowed.
5. The following is an examiner's statement of reasons for allowance:
Claims 1 – 5 recite, inter alia, a method of forming a metal silicide

layer in a semiconductor device comprising the steps of forming a first gate structure including a first gate electrode and a first spacer on a first region of a substrate, forming a second gate structure including a second gate electrode and a second spacer on a second region of the substrate, partially removing the first and second spacers to different depths such that side portions of the first and second gate electrodes are exposed by different amounts in thickness and forming a metal silicide layer on the first and second electrodes having the different exposed thicknesses, wherein the metal silicide layer formed on the second gate electrode has a second thickness that is different from a first thickness of the metal silicide layer formed on the first gate electrode. Although, Blair, US 6,103,610 and Chen, US 6,391,750 teach methods of making metal silicides of two different thicknesses on two gate electrodes formed in two different regions of the substrate, they fail to teach the step of removing the spacers for achieving their results. Additionally, the art of record does not disclose or anticipate the above limitation in combination with other claim elements nor would it be obvious to modify the art of record so as to form a device including the above limitation.

Claims 8 – 12 recite, inter alia, a method of forming a metal silicide layer in a semiconductor device comprising the steps of forming a first gate structure including a first gate electrode and a first spacer on a first region of a substrate, forming a second gate structure including a second gate electrode and a second spacer on a second region of the substrate, partially removing the second spacer to partially expose upper side portions of the second gate electrode, removing partially and simultaneously

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the first and second spacers, and forming a metal silicide layer on the first and second gate electrodes, wherein a second thickness of the metal silicide layer formed on the second gate electrode is greater than a first thickness of the metal silicide layer formed on the first gate electrode.. Although, Blair, US 6,103,610 and Chen, US 6,391,750 teach methods of making metal silicides of two different thicknesses on two gate electrodes formed in two different regions of the substrate, they fail to teach the step of removing the spacers for achieving their results. Additionally, the art of record does not disclose or anticipate the above limitation in combination with other claim elements nor would it be obvious to modify the art of record so as to form a device including the above limitation.

Conclusion

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Asok K. Sarkar whose telephone number is 571 272 1970. The examiner can normally be reached on Monday - Friday (8 AM- 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William B. Baumeister can be reached on 571 272 1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Asok Kumar Sarkar

Asok K. Sarkar
September 9, 2005

Primary Examiner